

PHIL 255
Week 6: Machines
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Please turn off and put away all electronics.

Please avoid the last 2 rows.

Machine intelligence
 Functionalism



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Machine Intelligence



Successes:

- Google driverless car, translation
- IBM Watson
- Robot scientist
- Mars rover
- Spaun



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Approaches to MI



Symbolic reasoning: logic, rules, case-based reasoning

Neural networks (connectionism)

Statistical

- Bayes networks
- Machine learning

Synthesis: Eliasmith's semantic pointer hypothesis



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Turing Test

Turing Test (1950): use a text-based interface to see if people can tell the difference between communication with a computer and a human.

Not sufficient: people can be tricked, e.g. by Eliza.

Not necessary: a computer might be found out it even though it is many respects more intelligent than people.

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For MI (AI)

Computers are getting faster with more powerful memories.

Successes: cars, Watson, etc.

Advances in neuromorphic computing

Silicon chip replacement thought experiment

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Against MI

Progress has been slow and disappointing.

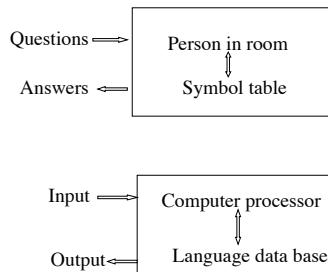
Computers will never be capable of consciousness, emotions, free will, etc.

Searle's Chinese room argument.

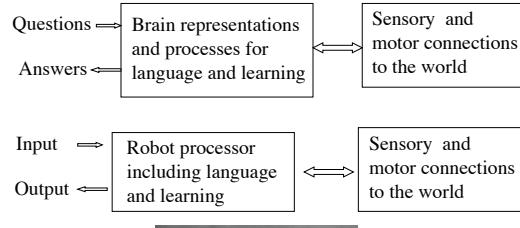
Ethics: vs. machine domination.

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Searle's Chinese Room



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Responses to Searle

The person in the room would not produce natural language.

The analogy only applies to the simplest computers.

A robot with the capacity to interact with the world and learn from its experience would have meaning and intentionality.

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Discussion Question

So you think computers will ever be as intelligent as humans?

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Functionalism



Mental states are not defined by a special substance (dualism) or physical constituents (mind-brain identity).

Mental states are defined by functional causal relations to sensory inputs, behavioral outputs, and other mental states.

Main argument for functionalism: multiple realizability of mental states in non-human brains, computers, etc.

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Against Functionalism

Option: restricted mind-brain identity theory: human mental states are brain states.

Dualist arguments: zombie, etc.

Materialist arguments:

The more we learn about the brain, the more we realize that physical structure matters: brain organization, neurotransmitters, glial cells, etc.

Computers might have consciousness, but it would be very different from human experience.

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